2006
Great Basin
Annual Operating
Plan
for
Fire Weather
and
Predictive Services

28 February 2006

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GREAT BASIN
ANNUAL OPERATING PLAN
2006

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0. INTRODUCTION

This document serves as the Interagency Annual Operating Plan (AOP) for Fire Weather and Predictive Services for the Great Basin, which includes the Eastern and Western Great Basin Geographic Areas. The general relationship between NWS and the interagency fire management community is set forth in the National Interagency Agreement for Meteorological Services. The AOP provides specific procedural and policy information regarding the delivery of meteorological services to the fire management community in the Great Basin area as allowed under the umbrella of the National Agreement.

References will include:

- National Weather Service NWSI 10-4: Fire Weather Services
  (www.nws.noaa.gov/directives/010/010.htm)
- Interagency Agreement for Meteorological Services (National MOA or "National Agreement")
  (www.nws.noaa.gov/directives/010/pd01004006a.pdf)
- Great Basin Mobilization Guide
  (www.blm.gov/utah/egbcc/trng_pub.htm)
- National Interagency Mobilization Guide
  (http://www.nifc.gov/news/mobguide/index.html)

I. SIGNIFICANT CHANGES SINCE LAST YEAR

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- Changes to Red Flag Criteria for Las Vegas, Flagstaff CWFA (proposed)
- Proposed Red Flag change from WFO Boise
- Expanded support for FARSITE

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II. ORGANIZATIONAL DIRECTORY

Cooperating federal and state land management agencies in the Great Basin include:

Bureau of Land Management	USDA Forest Service
Bureau of Indian Affairs	National Park Service
US Fish and Wildlife Service	Utah Forestry, Fire, and State Lands
Idaho Department of Lands	Nevada Division of Forestry

Fire weather products and services are provided by Eastern and Western Great Basin Predictive Services and the following NWS WFO's

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Boise, ID	Elko, NV	Flagstaff, AZ
Grand Junction, CO	Las Vegas, NV	Pocatello, ID
Reno, NV	Riverton, WY	Salt Lake City, UT

Additional Administrative Support is provided by:

NWS Central Region	NWS Western Region
National Interagency Fire Center	

Contact information for Predictive Services and the NWS offices can be found in Appendix A. Service areas are depicted in Appendix B. NOTE: All phone numbers are unlisted and should not be given to the general public.

III. NATIONAL WEATHER SERVICE -- SERVICES AND RESPONSIBILITIES

A. Basic Services

Basic services constitute the collective suite of operational fire weather forecast products and professional services provided by the NWS. Any changes to these forecast services or implementation of new operational forecast products and/or services will be coordinated with the Land Management Agencies' Predictive Services Units (PSUs) at either, or both, coordination centers (Reference NWSI 10-403) and with local land management officials within the County Warning Forecast Area (CWFA) of the NWS office that is proposing the changes. Any non-operational forecast products will be clearly labeled as "Experimental" or "Prototype".

1. Planning Forecasts (FWF)

Planning forecasts (or preparedness forecasts) are issued by all NWS WFO's offices serving the Great Basin. These forecasts provide general, zone-based information used in daily planning and preparedness.

a. Issuance Times During Fire Season

Forecasts will be issued during the fire season. Twice per day fire weather forecast requirements should run from May 1 to October 31, with regional variations dependent on weather, elevation and latitude. Local start and stop dates shall be coordinated between the NWS offices and fire weather customers, including the geographic area Predictive Services Units. Modifications to these start and stop dates will be enumerated in Appendix B, National Weather Service Offices.

Two forecasts should be issued daily – a morning forecast issued no later than 0730 local time and an afternoon forecast issued by 1530 local time – 7 days a week. Because of the large north-to-south extent of the Great Basin and seasonal variations in weather and fire occurrence, only one issuance per day may be sufficient during the early spring or late fall. This must be coordinated with either or both of the geographic area coordination centers and the local land management agencies affected.

b. Issuance Outside Fire Season

Not all WFO's issue fire weather planning forecasts year-round. However, all WFOs issue spot forecasts upon request at any time of year.

c. Forecast Updates

During the first 36-48 hour time period, forecasts will be updated when: 1) A Fire Weather Watch or a Red Flag Warning is issued, cancelled, or updated; 2) when any of the amendment criteria in Table 1 are met over a meteorologically significant area; or 3) typographic or formatting errors that confuse the intended meaning are detected.

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Table 1. Fire Weather Forecast and Associated Digital Data Amendment Criteria

Fire Weather Forecast and Associated Digital Data Amendment Guidelines	
Forecast	**AMEND WHEN…**
Thunderstorms are not in the forecast…	Thunderstorms occurring or are expected prior to the next routine planning forecast issuance.
Wind speed of 15 mph or greater…	Speed exceeds forecast by 10 mph or more.
Average minimum RH is 16% to 40%…	Differs by 10% or more.
Average minimum RH is 15% or less…	Differs by 5% or more.

During normal business hours, the GACC Meteorologist or Coordinator on Duty (COD) should be notified when a forecast is updated. Voicemail should be avoided. The GACC will notify all impacted Dispatch and Communications Centers. CODs can be reached at the main number for each center listed in the Appendix. No special notification is required during non-business hours.

d. Access

Forecasts are transmitted ~~automatically~~ through the NWS AWIPS computer system and automatically posted to the World Wide Web (Internet). Forecasts ~~are also available on~~ can be accessed through WIMS, the Great Basin Predictive Services' web sites, and the web sites of the various NWS offices that serve the Great Basin. Links can be found in Appendix B.

e. Content and Format

Forecasts will conform to ~~either of~~ the national standard narrative ~~or tabular~~ formats, per NWSI 10-401 ~~(all Great Basin NWS offices currently use the narrative format and are encouraged to continue to do so to maintain uniformity).~~ Morning forecasts will focus on the following 36 hours (3 operational periods). Afternoon forecasts will focus on the following 48 hours (4 operational periods). General extended outlooks will cover, at a minimum, the next 5 calendar days.

Each forecast will begin with pertinent headlines and a brief, non-technical weather discussion highlighting significant weather events or critical fire weather patterns. Headlines are required for Red Flag Warnings and Fire Weather Watches and are encouraged for other significant fire weather elements that do not meet Red Flag criteria. Affected zone segments of the planning forecast must also include the appropriate headline.

Forecasts for the first 36 or 48 hours will contain the ~~following~~ elements shown in Tables 2 and 3 below for each zone or zone grouping, listed in the order they will appear. Format examples and descriptions of forecast elements can be found in the appendices.

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Table 2. Planning Forecast (FWF) Elements

Forecast Element and Order	Requirement	Remarks
Headline(s)	National	As appropriate
Sky/Weather	National	
Temperature and 24-hour trend	National	In complex terrain, temperature and relative humidity should be forecast at discrete elevations (e.g., 3000-ft, 5000-ft, 8000-ft, etc) or at generally accepted locations (i.e., valley bottom and mid-slope). These should be coordinated with the local land management and Predictive Services.
Humidity and 24-hour trend	National	
Wind – 20-ft RAWS standard (slope/valley)	National	Wind speed must conform to the NWCG standard of 20-foot, 10-minute average wind.
Wind – Ridgetop (as appropriate)	National	
Chance Wetting Rain (0.10 inch)	Great Basin	
Lightning Activity Level (LAL)	Great Basin	As defined in Table 3.
Haines Index	Great Basin	
Mean Mixing Height	Optional	
Mean Transport Wind	Optional	
Ventilation Index (kt-ft)	Optional	
Clearing Index	Optional	
Extended forecast to day 7	National	One extended forecast at end of planning forecast or each zone depending on local agreement.

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Table 3. Lightning Activity Level Definitions

Lightning Activity Level Definitions		
LAL	**Areal Coverage Description**	**Area Coverage**
1	No lightning.	
2	Isolated wet or dry thunderstorms.	Less than 15% coverage.
3	Widely scattered wet thunderstorms.	15% to 24% coverage
4	Scattered wet thunderstorms.	25% to 54% coverage
5	Numerous wet thunderstorms.	55% to 100% coverage
6	Widely Scattered or greater dry thunderstorms.	15% or greater coverage

2. Spot forecasts

Spot forecasts are site-specific forecast products issued for wildfires, prescribed burns, aerial spraying, HAZMAT incidents, search and rescue, and other activities conducted by the land management community. Spot forecasts are available by request, 24-hours a day, 365 days a year. Spot forecasts are available to any federal, state, County, or municipal agency as described in NWSI 10-401.

The priority for spot forecast issuances and updates are described in NWS Western Region Supplement 14-2003, Prioritizing Products and Workload Activities for Western Region Forecast Offices.

Site-specific forecasts are considered one-time requests. Updates will be issued when:

i. The forecaster determines that the current spot forecast does not adequately represent current or expected weather conditions, or;
ii. Land management personnel communicate to the forecaster that the current forecast appears unrepresentative of conditions at ~~on~~ the site, or;
iii. A typographical or formatting error that confuses the intended meaning is detected.

Updates will be disseminated to users in the same manner as the original spot forecast. If the update is initiated by the NWS, a follow-up phone call will be made to inform the user (i.e., the original requestor) that an update has been issued. If the update is requested by the user, a contact point number will be provided.

a. Content and Format

Spot forecasts may contain the following elements as requested by the user. (Table 4).

Table 4. Spot Forecast Elements

Forecast Element	Requirement	Remark
Headline	National	Required if watch or warning is in effect when spot is issued.
Discussion	National	
Sky/Weather	National	
Temperature	National	
Relative Humidity	National	
20-ft, 10-minute average winds	National	
Transport winds, mixing height, LAL, Haines Index, Chance of wetting rain, etc.	By Request	Request made via NWS Spot web interface or on Spot Forecast Request Form D-1

The valid time will be determined at the time of the request. Most spots contain three periods, usually “TODAY”, “TONIGHT”, and “NEXT DAY,” but users will indicate the period(s) for which a forecast is needed.

b. Procedures for Preparing and Requesting Spot Forecasts

Internet-based NWS Spot is the standard for requesting and retrieving spot forecasts and should be used when available. It is accessible via web sites of the NWS offices that serve the Great Basin area and on the coordination center web sites, found in Appendix B.

When Internet access is not possible, spot forecasts may be requested and disseminated via fax - using the backup spot forecast request form (found in Appendix G). Spot forecasts should be available in less than 60 minutes of the time the NWS office receives the request. If a spot

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forecast is not returned within 60 minutes, the requestor should contact the NWS office immediately. Spot forecasts may be requested well in advance of a planned project, for example, the night before. In such situations, it is strongly recommended that the requestor indicate the latest time he or she needs the forecast returned. If not provided by the requestor, the NWS forecaster should ask for it.

The requestor ~~should~~ must provide information about the location (latitude/longitude preferred), topography, fuel type(s), top and bottom elevations of fire or project (if appropriate), size of fire or project, ignition time (if appropriate), and a contact name(s) and telephone number(s) of the responsible land management personnel. The request will also include quality, representative observations at, or near, the site. A detailed description of the observation location relative to the project (if not at the site) should be provided. The description should include, at a minimum, distance and direction from the project or fire site, station elevation and aspect.

c. Spot Forecast Feedback Requirement

Good communication between fire managers and the NWS is critical for quality spot forecast services. Land management should provide feedback to the NWS forecasters on the quality and accuracy of the spot forecast. Feedback should also be relayed to GACC meteorologists. Responsibility for providing fireline observations for the verification of forecast accuracy rests with the land management agencies, as outlined under, "Fire Weather Observations," Section V-F.

d. FARSITE support.

All WFOs supporting fire agencies in the Great Basin will automatically provide FARSITE weather data when a wildland fire spot forecast is requested. This data will be posted on the WFO's fire weather web page for retrieval as needed. FARSITE weather data support can also be requested independently from a spot forecast by calling the WFO. A latitude and longitude of the fire or incident is required to provide FARSITE data.

3. Red Flag Warnings and Fire Weather Watches

The Red Flag Warning and Fire Weather Watch program is designed to provide land management officials with advanced notice of weather conditions that, when coupled with critical fuels conditions, can lead to extreme fire behavior or heightened potential for large fire starts. It is implicit that firefighter and public safety is of the utmost importance. Identification of Red Flag events is a shared, collaborative responsibility between land management officials and NWS fire weather forecasters. Land management officials must identify critical fuels conditions. Weather forecasters must identify weather conditions that will contribute to extreme fire behavior or heightened large fire potential.

A Red Flag Warning shall be issued when Red Flag weather criteria (defined below) are forecast to occur within the next 24-hours or are already occurring, and are coupled with critical fuels conditions.

A Fire Weather Watch shall be issued when there is a high potential for Red Flag weather criteria to be met in the 12-72 hour time frame. The watch may be issued for all, or selected, portions within a fire weather zone or region.

a. Criteria

Standardized criteria for issuance of Red Flag Warnings and Fire Weather Watches in the Great Basin area are a combination of weather and critical fuels conditions. A standardized set of Red Flag Criteria have been developed to simplify issuances and to facilitate coordination and ensure continuity between neighboring NWS offices as well as across land management

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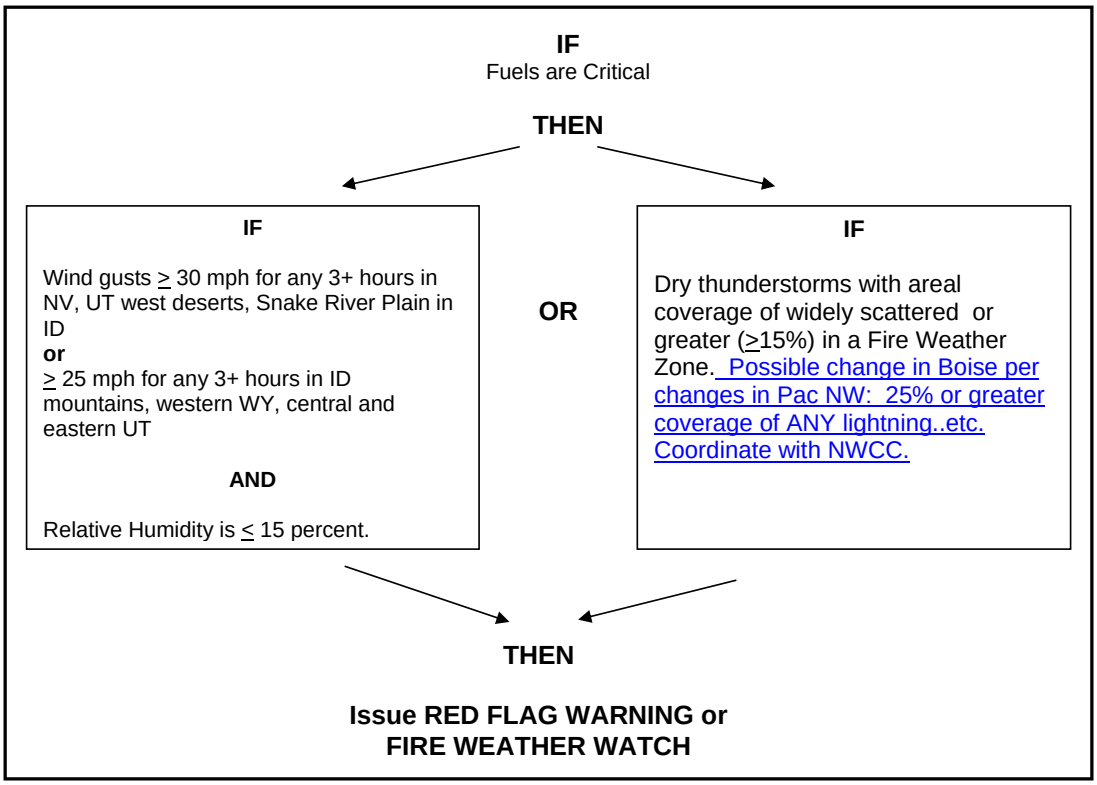
administrative boundaries. While no set of criteria can possibly accommodate all areas equally within the Great Basin, land management officials and their servicing NWS office may address local concerns not specifically accounted for in the standard criteria.



These criteria assume the following:

i. For Eastern Great Basin, in the absence of local (CWFA) agreements, fuels conditions must be listed as CRITICAL on the Fuels Status Table/Map. Fuel status must be updated and maintained at least weekly. Fuel status must indicate when it was last updated. For Western Great Basin CRITICAL on the Fuels Status Table/Map and/or the NFDRS Adjective Rating (as displayed on the WFAS website) must be High, Very High, or Extreme will be used to determine fuels condition.
ii. The mid-point of a forecast range is the breakpoint for watch/warning issuance. Additionally, forecast ranges should not exceed 10 mph.
iii. Wind gusts speed must be from NWCG compliant RAWS stations (20-foot) or a NWS/FAA ASOS station (10 meter). Wind gust speed measurements from other observation platforms will be used upon agreement between NWS and land management agencies.

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Additional (optional) criteria will be left to agreements between local NWS offices and land management agencies within their CWFAs. These may include but are not limited to: location-specific, alternative values to the standard criteria above; Haines Index; windshifts; cold frontal passages (CFP); first lightning after extended hot, dry period; drought; poor overnight RH recovery; or combinations of any of these. Additional criteria can be implemented as justification for a warning ONLY after coordination with the NWS, local land management officials and Predictive Services meteorologists.

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In rare situations, forecasters may issue a watch or warning for conditions which do not meet the established criteria but in their best judgment, and after coordination with local land management officials, will contribute to extreme fire behavior or heightened large fire potential.

b. Product Format and Content

A Red Flag Warning/Fire Weather Watch statement (RFW) will be used for issuing, updating, and canceling all Red Flag Warnings and Fire Weather Watches. This message will include:

i. Headline that includes a description of the watch or warning, a description of the area (i.e., counties, agency administrative unit, etc.), and the time period for which the watch or warning is valid;
ii. List of fire weather zones impacted, and;
iii. Short discussion detailing the causes and nature of the event.

c. Procedures and Access

When Red Flag Warnings and Fire Weather Watches are issued, they will be headlined in both the fire weather planning forecast and any subsequent spot forecasts. In the fire weather planning forecast, the headline shall appear at the beginning, before the discussion section, and at the beginning of each zone or zone grouping affected by the warning or watch. The headline will be in the same descriptive format as on the RFW product itself. If issuance of a Red Flag Warning or Fire Weather Watch requires an update of the fire weather planning forecast, the NWS office will confirm receipt at affected dispatch centers and Predictive Services of the appropriate GACC as soon as possible. Red Flag Warnings and Fire Weather Watches will remain in effect through the expiration time noted in the fire weather planning forecast, or until canceled or updated.

Red Flag Warnings and Fire Weather Watches are available in WIMS, the Great Basin Geographic Area Coordination Center Predictive Services web page and the web sites of the NWS offices that serve the Great Basin area. Websites are listed in Appendix B.

4. National Fire Danger Ratings System (NFDRS) Forecasts

The National Weather Service will provide National Fire Danger Ratings System (NFDRS) forecasts valid at 1300 LST (1400 LDT) the next day after issuance. These forecasts are used to prepare the NFDRS fire danger indices for the next day.

a. Criteria for Issuance

NWS will issue NFDRS forecasts daily when NFDRS-compliant observations are received. NFDRS observations must be complete and available in WIMS by 1350 LST (1450 LDT) to be received by NWS in time to produce a forecast. Stations that do not have valid observations in WIMS on time will not receive an NFDRS weather forecast and, thus, will not receive forecast fire danger indices for the next day.

b. Content and Format

The content and format shall comply with NWSI 10-4 and is outlined in Appendix C for reference. The actual NWS NFDRS forecast product is used only by WIMS and is not viewable directly by fire management personnel.

c. Procedures

Each WFO will produce individual station or NFDRS zone forecasts. Valid observations must appear on the 1400 LST (1500 LDT) observation collective, or forecasts will not be generated. Forecasts may be in the form of a *trend forecast* for individual or grouped stations, or a *point*

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(station-specific) forecast. However, the form used should be coordinated with local land management officials and Predictive Services at the GACC, and should be uniform across the WFO fire weather area except when NFDRS station weather dictates a temporary separate forecast. When point forecasts are issued, NWS will ensure that forecast values are statistically valid relative to historical values for those stations.

5. Participation in Interagency Groups

NWS WFO's and local Interagency Dispatch Centers ~~providing service~~ within the Great Basin area shall send a representative to the annual AOP meeting. If ~~when such~~ a meeting is scheduled. Proxy representation is acceptable. NWS offices should participate in at least one outreach meeting per year, usually prior to the start of the next fire season with local fire management units. These meetings can be used to strengthen the customer relationship, present new or changes to services and address local concerns. GACC meteorologists should be included in these meetings. A GACC-wide fall review meeting can be used to review the previous season, discuss what worked and what did not and identify issues to be addressed for the next Annual Operating Plan.

B. RAWS Monitoring

Meteorologists should monitor the RAWS network for suspect or erroneous data. Forecasters should use sound meteorological judgment in determining if data is not representative of conditions. When an observation is identified as unrepresentative, forecasters should notify the Predictive Services meteorologist in the GACC where the observation resides to initiate maintenance or repair of the station in question.

C. Special Services

NWS will provide and maintain a cadre of trained Incident Meteorologists (IMETs). A sufficient number of IMETs should be available to support multiple incidents from May through September. Information regarding the dispatch of IMETs, both within and outside the Great Basin area, can be found in the Great Basin Mobilization Guide.

D. Forecaster Training

The NWS recognizes the need for specialized training in fire weather meteorology for forecasters. Any NWS meteorologist producing fire weather products shall have met the requirements set forth in NWSI 10-405.

IV. PREDICTIVE SERVICES/LAND AGENCIES – SERVICES AND RESPONSIBILITIES

Predictive Services units reside at both the Eastern and Western Great Basin Coordination Centers. The interagency coordination centers' primary mission is to provide resource support for the functional areas of overhead, crews, aircraft, supplies and equipment to the field for wildland fire and other emergency operations.

The Predictive Services units will provide daily, medium-range, and long-range fire weather, fire danger, and resource outlooks for use in tactical and strategic planning. These outlooks will complement short-term forecast products provided by the NWS.

A. Operational Support and Predictive Services

Predictive Services will produce a suite of products tailored to the tactical and strategic mission of the land management agencies within the Great Basin. While the main area of responsibility is at the geographic area level, Predictive Services will provide services to sub-units of the geographic area, such as dispatch centers and local administrative units. Contributions will also be made to the national level Predictive Services program. All products will be available on the Predictive Services web pages.

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Completion of "Intermediate Wildland Fire Behavior, S-290".¶
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Completion of local training which should focus on: (1) the effects of local terrain on fire weather parameters and fire behavior, with an emphasis on wind; (2) local fire weather forecast techniques; (3) local fire season climatology; and (4) Remote Automated Weather Stations (RAWS) observations.¶
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Knowledge of all NWS fire weather policy, products and services and proficiency in the preparation and dissemination of those products.¶
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Incident meteorologists (IMETs) and Program Leaders (FWPLs) may have additional recommended training, as set in NWSI 10-405. The course, "National Fire Danger Ratings System, S-491," is recommended but not required for NWS FWPLs and IMETs.

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1. Daily Fire Weather/Fire Behavior Map

The Daily Fire Weather/Fire Behavior Map is a text-and-graphics product which summarizes expected weather conditions and fire behavior for the next 24-hours. Fire behavior forecasts will be included when a Fire Behavior Analyst is assigned to Predictive Services at either or both of the coordination centers. This typically occurs when the Great Basin MAC is convened. The product will be issued at least once a day per the following schedule:

Early Spring	March 1 – April 30 (as needed or requested)
Spring/Summer:	May 1 – October 31 (daily)
Fall:	November 1 – November 30 (as needed or requested)

2. ~~Weekly Fire Weather/Fire Danger Outlook~~ 7-Day Significant Fire Potential Outlook

The ~~Weekly Fire Weather/Fire Danger~~ 7-Day Significant Fire Potential Outlook will address the potential for significant weather events (dry lightning outbreaks, precipitation events, wind events, etc.) that will have adverse or favorable impacts on fire occurrence or fire behavior in the next 7~~ to 10~~ days and that will require short-term decisions on resource availability and movements. The outlook will include observed trends and forecasts of NFDRS Energy Release Component (ERC) index and others.

The outlook will be issued weekly by the close of business (COB) every Tuesday, beginning in April and continuing through the end of the fire season, generally around the middle or end of October. Updates will be made when it appears that observed or expected conditions are significantly different than those contained in the product.

3. Monthly Fire Potential Outlook

The Monthly Fire Potential Outlook is a broader, more general assessment of weather, climate, and fuels conditions across the area. It incorporates climate trends, potential weather, and fuels condition and trends to make long-term predictions of impacts on fire business. Outlooks will focus on potential for large fire activity and time frames that will impact resource availability and mobilization relative to normal fire business for the time of year.

The Monthly outlook will be issued ~~by the first of the month~~ no later than 2 business days prior to the start of the month for which it is valid.

4. Seasonal Fire Potential Outlook

The Seasonal outlook is similar to the Monthly, except for a longer time period. This outlook attempts to predict the overall character of the upcoming fire season relative to a normal season (based on 5 to 10 year historical averages). The Seasonal is issued in the late winter or early spring prior to the onset of the fire season, and is updated at irregular intervals as needed, with a first update issued around mid-May. These times are not fixed, depending heavily on such factors as winter snowpack, onset and progress of snow melt, weather trends, fuels condition and trends, etc.

5. Fuels Status for Red Flags Table and Map Time to make this an official product and duty

Fuels Status for Red Flags table and map will be produced primarily to provide NWS forecasters with a snapshot of fuels conditions that would require a red flag warning or fire weather watch if weather conditions that would meet the red flag criteria (Section III.A.3) are expected or are imminent. These do not replace the NFDRS observed and forecast indices for fire danger. Instead, the fuels status table and map highlight areas where fuels conditions would support large fire growth or extreme fire behavior given the appropriate weather conditions. The tabular and graphical information also do not preclude coordination between the NWS forecasters and the local land management agencies they serve.

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The table will be updated weekly or immediately if fuels become critical by land management fuels specialists (or other designee). The map will automatically update to reflect what is displayed by the tabular data and indicate when it was last updated..

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B. Remote Automated Weather Stations (RAWS)

Predictive Services will monitor the RAWS network within the Great Basin. This will include identifying unrepresentative observations or inoperative equipment and ensuring the data record is complete and accurate for input into WIMS and NFDRS. Predictive Services will relay information regarding the network to, address issues and concerns with, and offer recommendations for improvements to the network to the USDA Forest Service Regional RAWS coordinator and to the BLM-NIFC RAWS Program manager, as appropriate. The appropriate NWS WFO(s) will be provided operational status updates in a timely fashion~~. as updated as necessary with status~~.

C. Land Management Liaison

Predictive Services meteorologists will act as the liaison on issues regarding weather, climate, and fuels between the land management agency partners in the Great Basin and service providers in these areas, including the NWS, private sector providers, and the research community.

D. Monitoring, Feedback, and Improvement of Fire Weather Information

Land management agencies will monitor all sources of fire weather information to ensure quality, consistency, and applicability. When significant issues arise, Predictive Services will address the issue with the service provider to enhance awareness and to work toward an appropriate solution. Items of significance include, but are not limited to:

1. General forecast consistency between County Warning and Forecast Areas (CWFAs), dispatch zones, and land management administrative units.
2. Red Flag Warning and Fire Weather Watch consistency with established criteria, timeliness of issuance, coordination and applicability.
3. NFDRS forecast consistency with station climate histories.
4. Quality of fireline observations and spot forecast feedback from the field.
5. Overall adherence to policy and procedure, especially as set forth in the AOP.
6. Feedback from the field on the quality of all forecast products, especially Red Flag Warnings and Watches and Spot forecasts.

It is imperative that field personnel provide timely feedback to the NWS about products and services. This information will be used to gauge the quality and validity of products and services, make improvements and to resolve any conflicts or discrepancies between products issued. Feedback should be provided as soon as possible so that action can be taken immediately. Feedback may be positive or negative but it should always be constructive and intended to provide information that will help improve products and services. Comments can be submitted through Predictive Services or directly to the NWS (with a copy to Predictive Services).

Resolution of issues shall follow procedures outlined in the interagency agreement found in Appendix F.

E. Technology and Data Transfer

Predictive Services will work to integrate advanced technology into analytical and prediction systems for use in fire management planning and operations. This will include regional numerical modeling, weather and fuels data assimilation and dissemination, and continued research and development in fire meteorology.

Where fire management computer systems, such as WIMS, are available, access will be granted to NWS for the purpose of obtaining and providing mission critical information, such as weather observations and forecasts.

F. Fire Weather Observations

Weather observations will be provided by the land agencies to the NWS to ensure sufficient information is available to produce quality forecast products. RAWS observations will comply with NWCG standards for quality and timeliness. RAWS will be sited and maintained in accordance with the NWCG PMS 426-3, "National Fire Danger Rating System Weather Station Standards."

Weather observations at or near the fire or project site conflicts with information on page 7 when requesting a spot forecast. Fireline observations are preferred. Agency personnel should provide observations containing, at a minimum: temperature, humidity, wind speed and direction, and weather and sky condition that complies with guidance provided in NFES 2140, "Weather Station Handbook – an Interagency Guide for Wildland Managers." In situations where a fireline or on-site observation cannot be obtained (remote location, time constraints, etc.) a nearby, representative RAWS observation may be used. Keep in mind that the quality of the observation, or how representative it is of conditions at the fire or project site, will affect the precision a forecaster can provide in a spot weather forecast.

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For large or complex planned projects requiring spot forecasts, such as prescribed burns, aerial spraying, rehabilitation, etc., it is strongly recommended that observations be taken for a minimum of seven (7) days, 24 hours a day, prior to commencement of the project. This will provide forecasters with a history of diurnal variations of weather, temperature, humidity, and wind at or near the project site. For smaller, less complex projects, such as pile burns, observations should be collected for a minimum of two (2) days.

G. Fuels Status

Land management agencies will provide fuels status information to the National Weather Service for use in the Red Flag program. This information shall be provided via a web-based Fuels Status for Red Flags table and map and shall be updated weekly by field personnel (FMOs, FBANs, fuels specialists or other designated persons). The idea is to provide the National Weather Service fire weather forecasters with an assessment of fuels conditions in each fire weather forecast zone to determine if weather conditions that meet the Red Flag criteria would warrant a watch or warning. The Fuels Status for Red Flags table and map do not preclude coordination between local fire personnel and the forecasters. Instead, it provides a snapshot of conditions that forecasters can reference when making weather forecasts.

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Predictive Services meteorologists will conduct coordination calls with fuels specialists as needed to coordinate the status of fuels to be presented to the National Weather Service. For Eastern Great Basin, calls will generally be scheduled for Monday mornings each week during the fire season (1 May through 31 October). Western Great Basin will notify participants when calls are needed.

Comment: Coordinate change to this with offices. Any suggestions, Rich??

H. Incident Response

The NWS is the provider of Incident Meteorologists (IMETs). Predictive Services meteorologists can respond to incidents when the NWS cannot provide a certified IMET within 24-hours of request receipt by the National Fire Weather Operations Coordinator (NFWOC). In these instances, and when requested by incident command staff, Predictive Services meteorologists will provide forecast support as a Technical Specialist until the arrival of a certified NWS IMET. Technical Specialists will not be used as a substitute for NWS IMETs. Forecast support will revert to the NWS IMET after a reasonable transition period.

VI. JOINT RESPONSIBILITIES

A. Briefings

Predictive Services or NWS meteorologists may be asked to provide briefings to agency decision-makers. These briefings generally occur during peak periods of the fire season or when a Multi-Agency Coordination (MAC) Group has been convened. The briefings usually include a short-term weather discussion of critical weather patterns and a longer-term discussion of trends during the next several days. The briefings provide tactical (operational) and strategic (planning) information for land managers.

Briefing schedules vary with planning and staffing levels, fire activity, and management priorities. Predictive Services will provide briefing schedules and conference bridge phone numbers, as needed.

B. Coordination Calls

Comment: Rewrite this section??

Do we want to tie call frequency to GACC PL???

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Predictive Services meteorologists will conduct a weekly coordination call between Predictive Services and NWS offices every Monday morning during fire season. The purpose of the calls is to discuss potential weather impacts on fire occurrence and fire behavior for the next 7 to 10 days. The discussion will start with Predictive Services meteorologists giving a brief assessment of fuel conditions and the critical weather events of most concern that will impact fire occurrence and behavior. NWS forecasters will then discuss the forecast and outlook for potential critical weather events. All attempts should be made to keep calls as short as possible, preferably under 15 minutes.

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Inserted: Comment – the intent was good early in the season, but they failed to show up later in the season.

A coordination call will be conducted as needed (in Eastern Great Basin, typically each Monday at 1000 MDT/0900 PDT) during fire season. Either Predictive Services meteorologists or NWS meteorologists can initiate a call. The method of notification will be determined jointly prior the beginning of the season. One possible method will be to post notification on the GACC website, triggering an (comment – this alarm was never developed. Who would do it, MSD, SOD, Roger?) alarm on NWS offices' AWIPS computers (the Redding GACC does this – Reno IT knows how to set-up). The message should be posted no later than 0830 local and should list the NWS offices needed for the call and a time for the call. Calls will generally be conducted beginning in early May in Eastern Great Basin and early June in Western Great Basin, as fire danger dictates, and continuing until no longer needed. In the event of conflict with coordination calls in other GACCs served by common NWS offices, arrangements will be negotiated between the Predictive Services units at the the GACCs and the results relayed to the affected NWS offices.

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Predictive Services will provide conference bridge phone numbers.

C. Training

Training for weather sections of S-190, S-290, and other fire weather courses can be provided at customer request. Requests can be made at any time of year to any of the NWS offices in the Great Basin. Requests will generally be met unless there are scheduling or staffing conflicts at the NWS office. In these cases, the requesting person or agency should provide alternate dates. If this is not possible, the NWS will assist in locating another trainer from another NWS office, or as necessity dictates, from the GACC.

Cross-training between NWS and GACC meteorologists is encouraged. NWS forecasters can detail at the GACC to gain an understanding of the decision support role Predictive Services fills in fire

operations. GACC meteorologists can shadow NWS forecasters to view the forecast preparation process utilizing the new technologies available at NWS offices. Scheduling of cross-training visits should be arranged as far in advance as possible to reduce impacts on operations. However, because of the rapidly-changing nature of fire operations, the best opportunity may come with short notice. Flexibility is necessary.

D. Verification of Fire Weather Products

Predictive Services and NWS meteorologists will cooperatively develop, perform, and report verification results of prepared fire weather products. These will include, but are not limited to: Red Flag Warnings and Fire Weather Watches; NFDRS point and/or trend forecasts; Weekly fire weather/fire danger outlooks. Data sources used in verification must be well-sited, representative of conditions being verified, and reliable. Data sources not listed explicitly in the AOP will be determined on a case by case basis by both NWS and Predictive Services meteorologists. Verification of Fire Weather Watches/Red Flag Warnings should generally occur within a few days of an event or a period of events. NWS and Predictive Services should discuss verification results at least once a month to ensure consistent verification methods are used and to share lessons learned from each event. These discussions can be conducted by conference call at a mutually agreeable time. Dates and times of verification conference calls can be arranged by email or by phone.

Comment: National verification of NFDRS will commence this coming fire season. NWS HQ is working with the WIMS people to get this going. I am unsure if this verification will require NFDRS points or zones.

E. Establishing or Modifying Forecast Zone Boundaries

Forecast zone boundaries shall be established and/or modified jointly by the NWS and the land management agencies with administrative responsibility for the affected lands. Predictive Services meteorologists should be included in negotiations. Existing zone boundaries may be modified to avoid splitting land management administrative boundaries between multiple NWS forecast areas. Changes must be agreed upon at least 120 days prior to implementation.

VII. EFFECTIVE DATES FOR THE ANNUAL OPERATING PLAN

The effective period for this Annual Operating Plan shall be 1 April 2006 to 31 March 2007. The AOP shall be deemed official when all signatories have accepted and signed the document. Updates or amendments may be added upon agreement of all signatories.

VIII. SIGNATORIES

_____

Sheldon Wimmer
Chair, Great Basin Coordinating Group
Bureau of Land Management
Utah State Office

Date: _____

_____

Richard H. Douglas
National Weather Service
Meteorological Services Division
Western Region

Date: _____

_____

J. Michael Looney
National Weather Service
Meteorological Services Division
Central Region

Date: _____

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~~but may be included for other situations including air stagnation, record heat, severe weather potential, significant weather pattern changes, etc.~~ Zones that have watches or warnings should be grouped separately from those without watches or warnings. However

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a minimum, zones with warnings or watches must be clearly identified in the forecast text. Forecast offices should coordinate this with local customers.

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Wildfire and Protection of Life
Prescribed burns and Wildland Fire Use (WFU)
All others

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Table 2. Planning Forecast (FWF) Elements

Forecast Element and Order	Requirement	Remarks
Headline(s)	National	As appropriate
Sky/Weather	National	
Temperature and 24-hour trend	National	In complex terrain, temperature and relative humidity should be forecast at discrete elevations (e.g., 3000-ft, 5000-ft, 8000-ft, etc) or at generally accepted locations (i.e., valley bottom and mid-slope). These should be coordinated with the local land management and Predictive Services.
Humidity and 24-hour trend	National	
Wind – 20-ft RAWS standard (slope/valley)	National	Wind speed must conform to the NWCG standard of 20-foot, 10-minute average wind.
Wind – Ridgetop (as appropriate)	National	
Chance Wetting Rain (0.10 inch)	Great Basin	
Lightning Activity Level (LAL)	Great Basin	As defined in Table 3.
Haines Index	Great Basin	
Mean Mixing Height	Optional	
Mean Transport Wind	Optional	
Ventilation Index (kt-ft)	Optional	
Clearing Index	Optional	
Extended forecast to day 7	National	One extended forecast at end of planning forecast or each zone depending on local agreement.

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Table 3. Lightning Activity Level Definitions

Lightning Activity Level Definitions		
LAL	**Areal Coverage Description**	**Area Coverage**
1	No lightning.	

2	Isolated wet or dry thunderstorms.	Less than 15% coverage.
3	Widely scattered wet thunderstorms.	15% to 24% coverage
4	Scattered wet thunderstorms.	25% to 54% coverage
5	Numerous wet thunderstorms.	55% to 100% coverage
6	Widely Scattered or greater dry thunderstorms.	15% or greater coverage

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unless otherwise specified upon request

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Spot forecast elements issued by user requests??

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This is only a placeholder – exact format TBD. Time steps may be 3 hrs. New NWSI 10-401 will reflect this change.

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or downloadable from http://www.wrh.noaa.gov/pih/firewx/index.php)

Page 6: [10] Inserted **Edward Delgado** **3/18/2005 10:38 AM**

http://www.wrh.noaa.gov/pih/firewx/index.php